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Dr. Hugh McManus

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Hugh McManus is a Senior Special Projects Engineer at Metis Design, applying modern product development, business and technical practices to the aerospace industry. He has done pioneering work in application of lean techniques to product development with MIT's Lean Aerospace Initiative (LAI), including leading seminars and workshops, supervising research, and authoring several tools for lean transformation. He is currently facilitating lean short courses and transformation events using a unique business simulation (co-developed with Eric Rebentisch of LAI) to rapidly teach advanced lean concepts, and allow participants to experience lean transformations in a simulated environment. He is also developing, and working with, advanced tools for space system architecture and design.

He recently co-authored a book on lean methods in the Aerospace Industry, *Lean Enterprise Value,* and published several major tools and reports, including the LAI tools "Product Development Value Stream Mapping (PDVSM)" and "Product Development Transition to Lean (PDTTL)," and an extensive report on new Space System Architecture methods. He has also co-edited a book on applications of polymer composite materials, has been an associate editor of the *AIAA Journal of Spacecraft and Rockets*, and has published over 60 peer-reviewed journal and conference publications. Recent publications include "Value Stream Analysis and Mapping for Product Development" (with R. Millard), "New Methods for Rapid Architecture Selection and Conceptual Design" (with D. Hastings and J. Warmkessel), "A Framework for Understanding Uncertainty and its Mitigation and Exploitation in Complex Systems" (with D. Hastings) and "Lean Engineering: Doing the Right Thing Right" (with A. Haggerty and E. Murman).

Dr. McManus has also taught and practiced aerospace structures and materials. He was a structural engineer at Lockheed Missiles and Space Company (now a division of Lockheed Martin), and at Kaman Aerospace for a total of 10 years, and taught structures and materials courses at MIT for 7 years. He remains actively interested in aerospace structural engineering, composite materials, structural health monitoring, and high-temperature polymer materials.

Dr. McManus received a Ph.D. degree in Mechanical Engineering from Stanford University in 1990, and S. B. and S. M. degrees in Aeronautics and Astronautics from MIT in 1980 and 1981. He has worked at Kaman Aerospace (1981-84) and Lockheed Missiles and Space Company (1984-1990), as the MIT Aeronautics and Astronautics Boeing Career Development Professor for 1991-94, the Class of 1943 Career Development Professor for 1994-97, Associate Professor for 1997-98, and as a Principal Research Engineer from 1998-2002. He is an Associate Fellow of the American Institute of Aeronautics and Astronautics.